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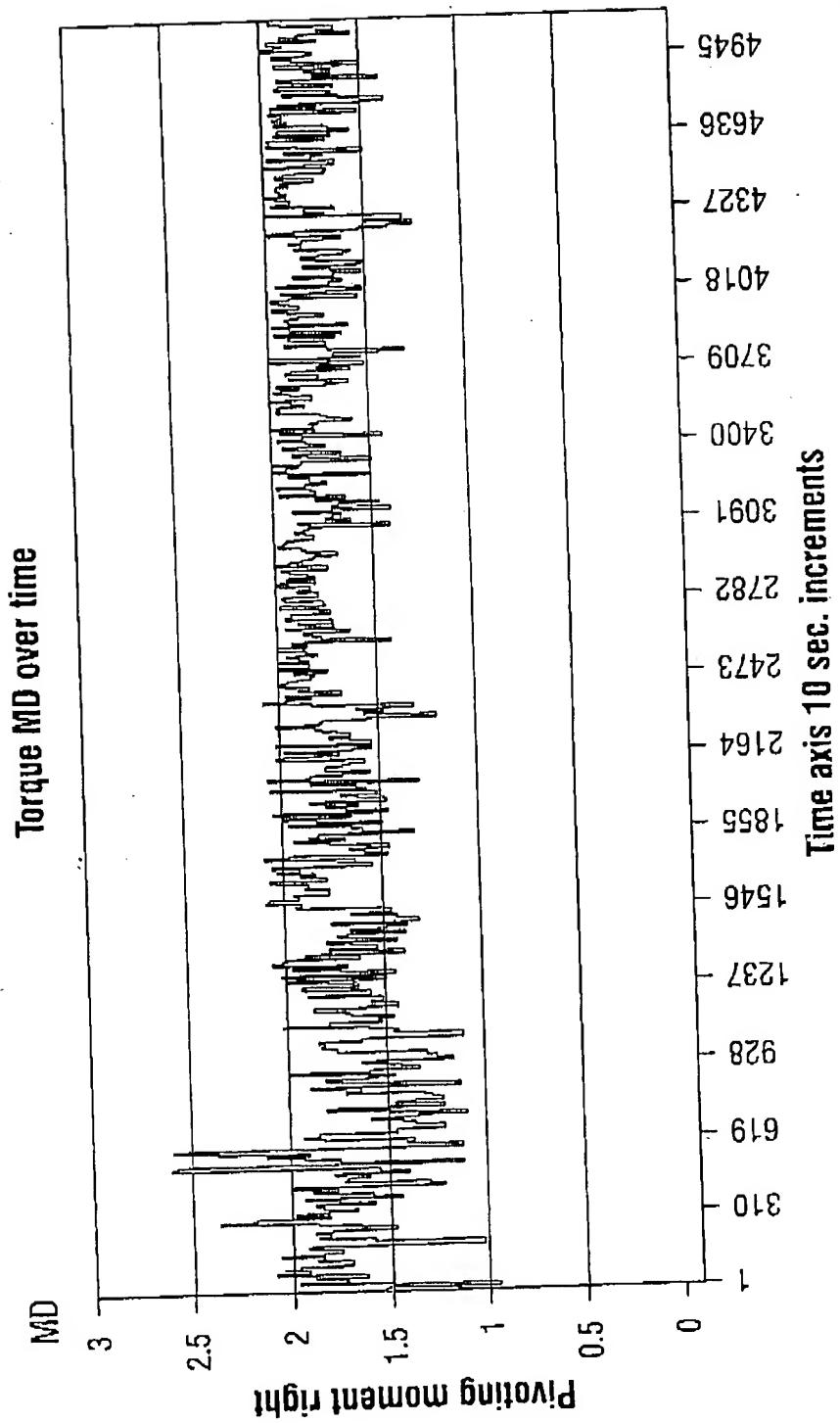


Fig. 1 : Measured torque MD of a produced hinge over time (time axis in 10 second increments)

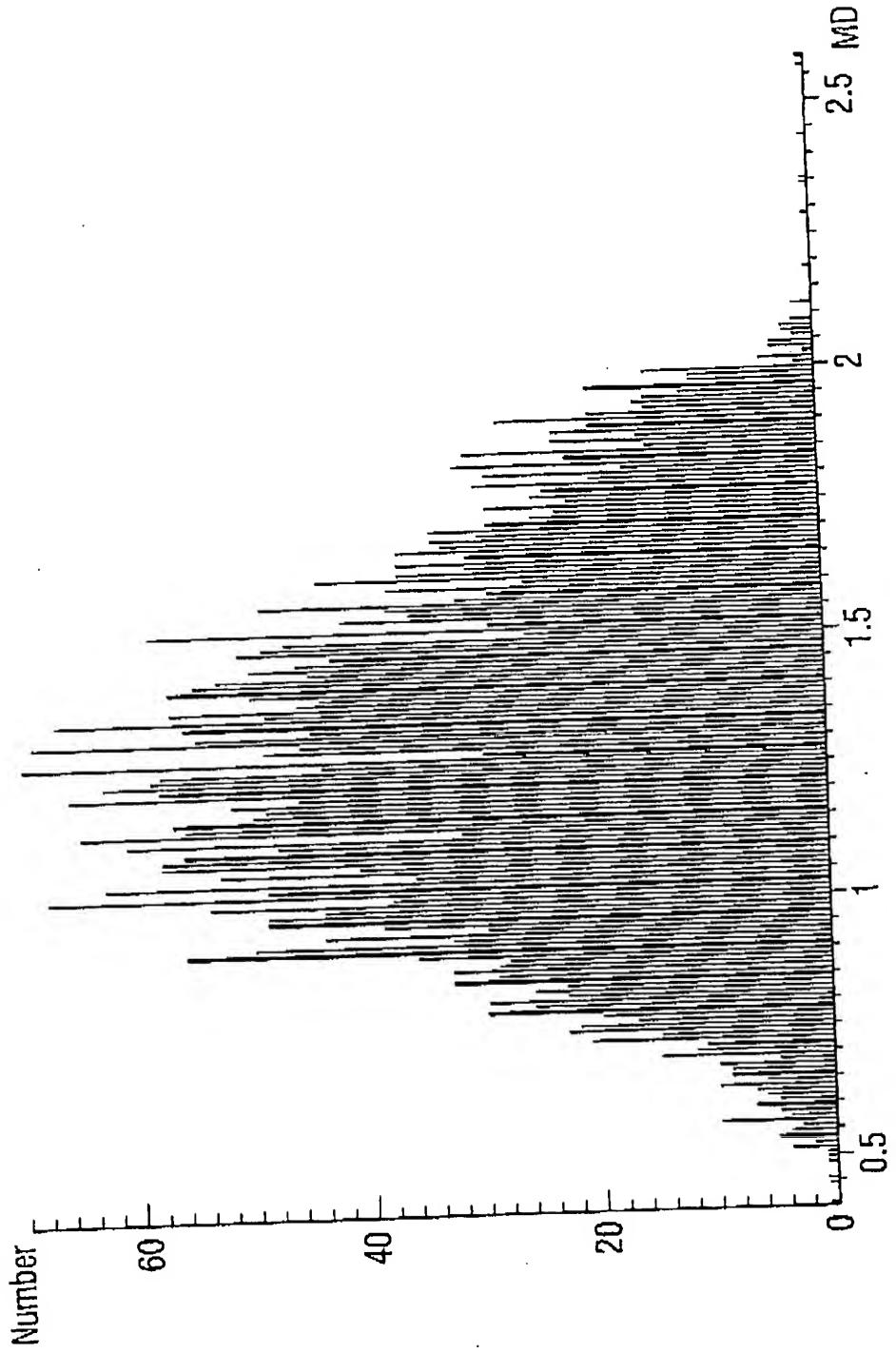


Fig. 2 : Histogram of the torque MD with the measuring range 0 Nm to 2.5 Nm on the X-axis

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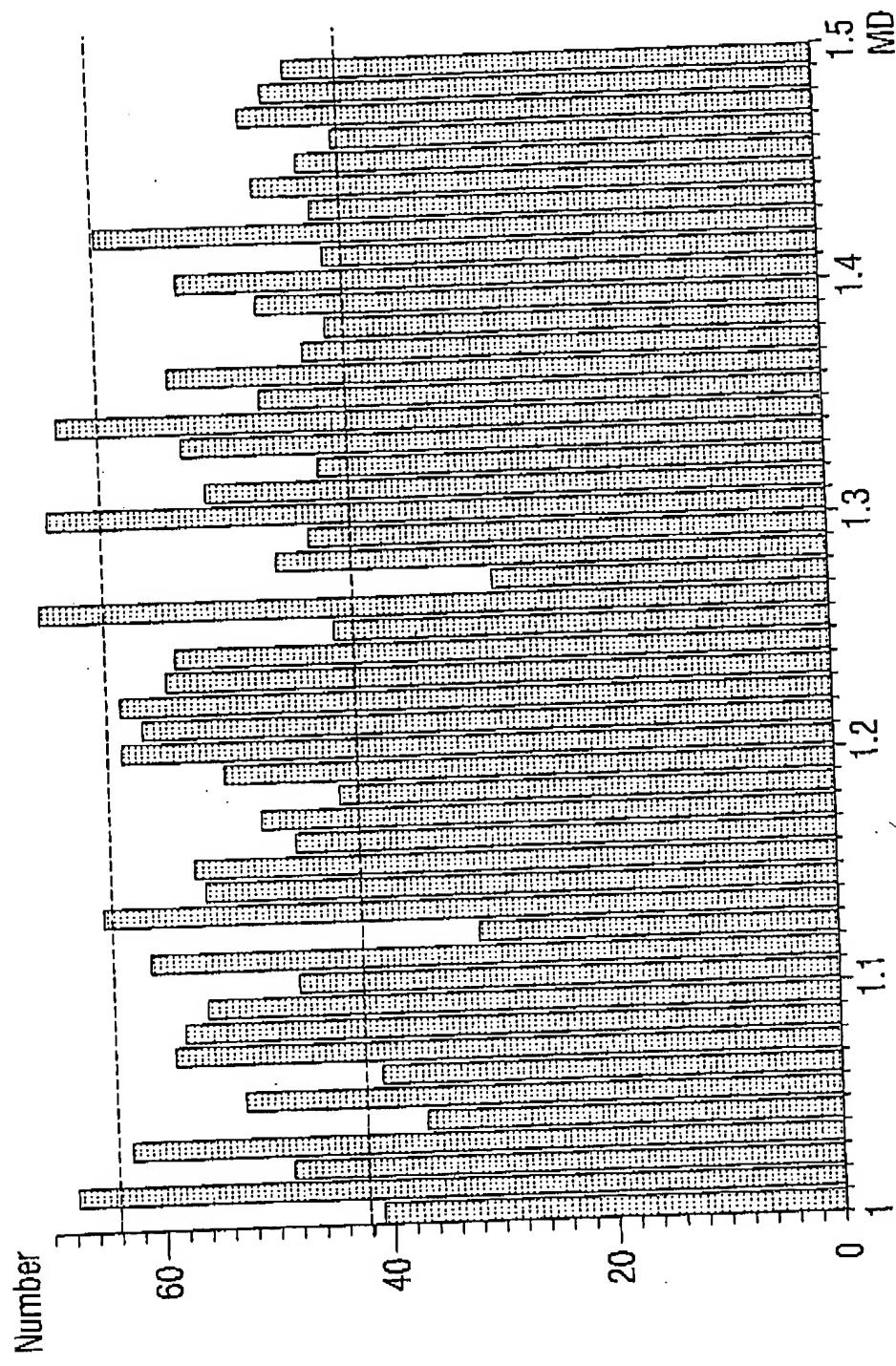


Fig. 3 : Histogram of the torque MD with the measuring range 1.0 Nm to 1.5 Nm on the X-axis

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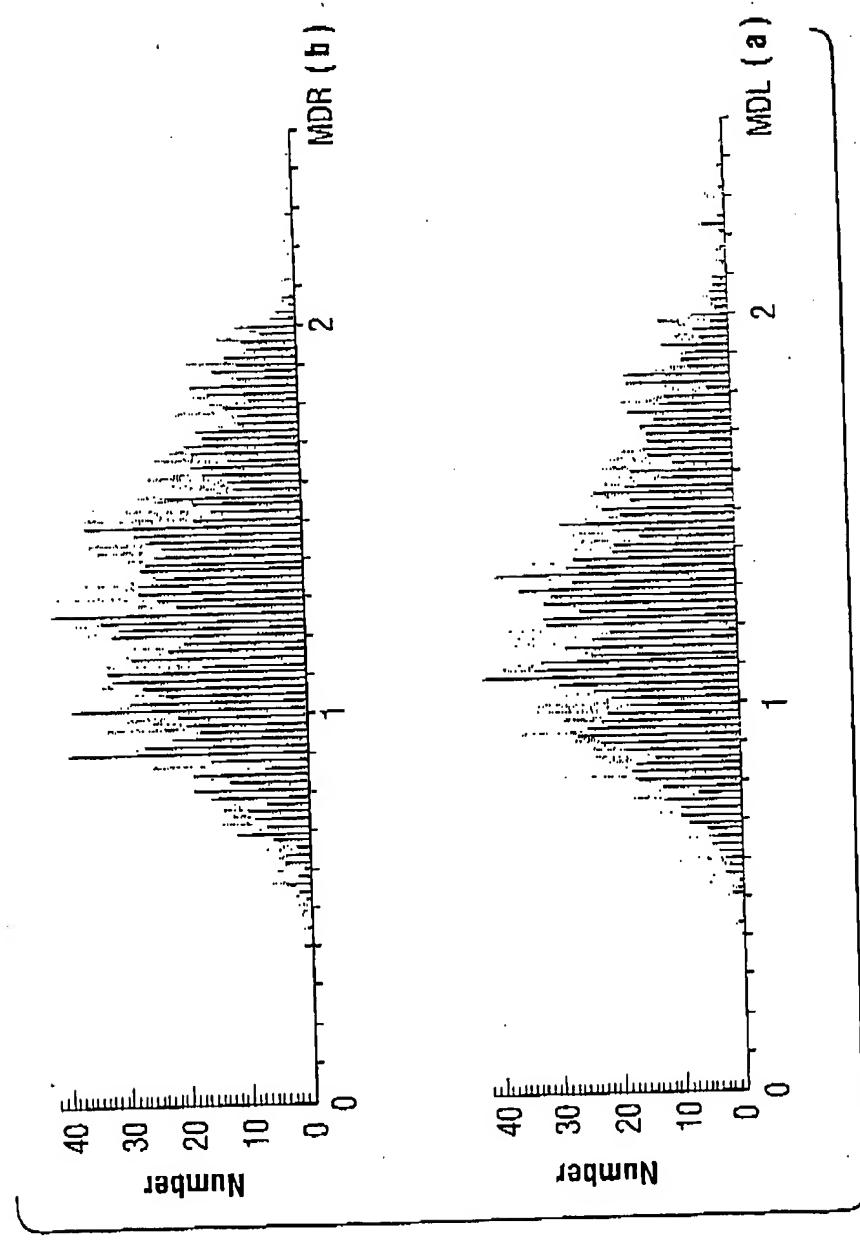


Fig. 4: Fine structure of histograms for two production lines for right and left hinges produced 3 days simultaneous in time

- a) Hinges left MDL
- b) Hinges right MDL

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Global-Scaling-Calculation (GSC) 3000 professional

File Analysis F2 Synthesis F3 Optimization Reset F5 Help

Current DS Analysis Synthesis Pre-History Post-History Reset Optimize Super-flexib.

No. Designation: Category:

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SubY: 1.503283193505E-10 SubZ: SubX:
IntY: 1.503274152807E-10 IntZ: IntX:

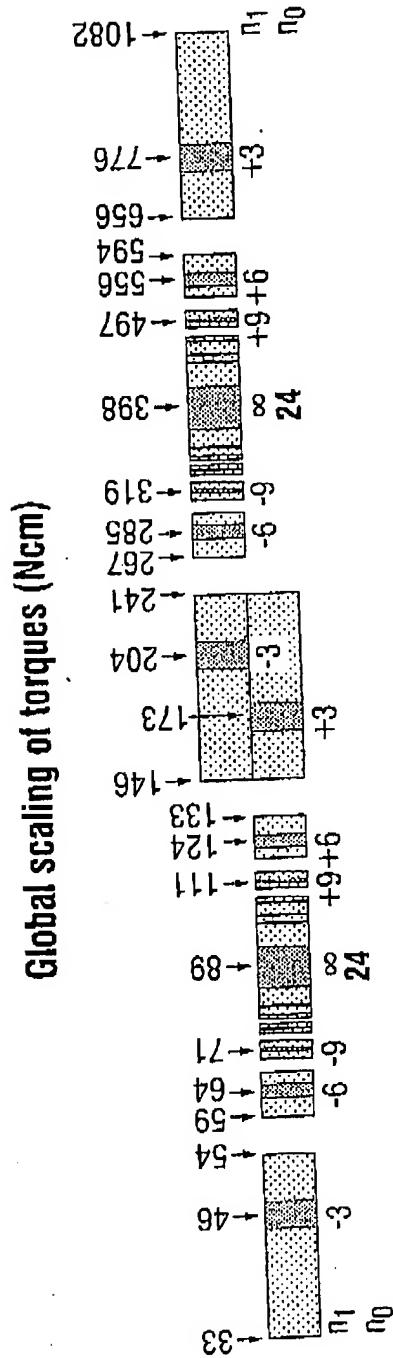
Measure: W X Y Z SubN0: IntN0:
X: SubN1: IntN1:
+dX: SubN2: IntN2:
-dX: X take over

PartZ: GlobH: GlobC: SubY:
IntY:

Fig. 5 : GSC3000 tool for GS analysis of physical and technical variables

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Hinge. G : GS analysis of torque (in Ncm) of automotive hinges

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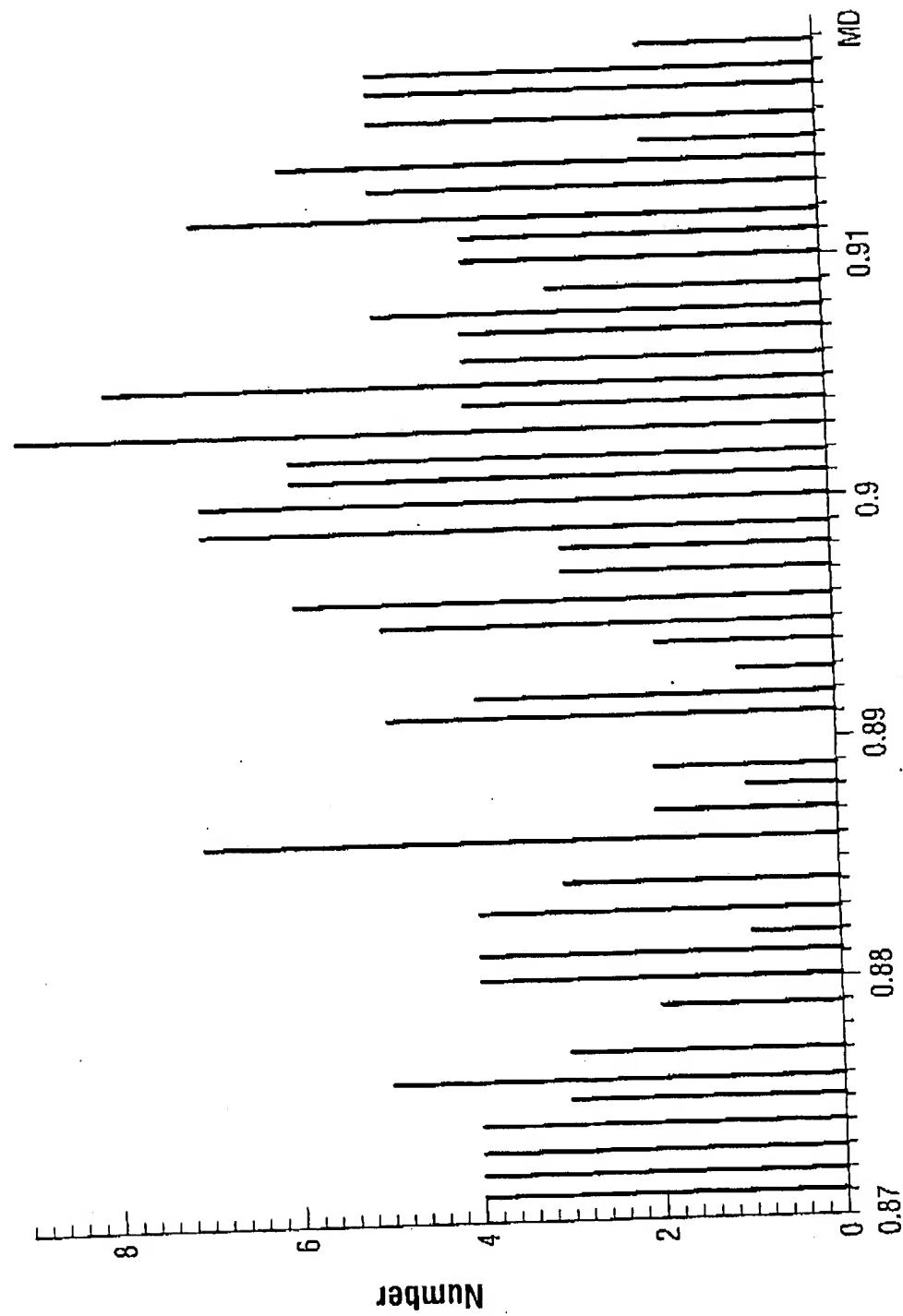


Fig. 7 : Histogram of generated torques in a range of 0.87 to 0.92 Nm

KF PRACTICE B/N 1

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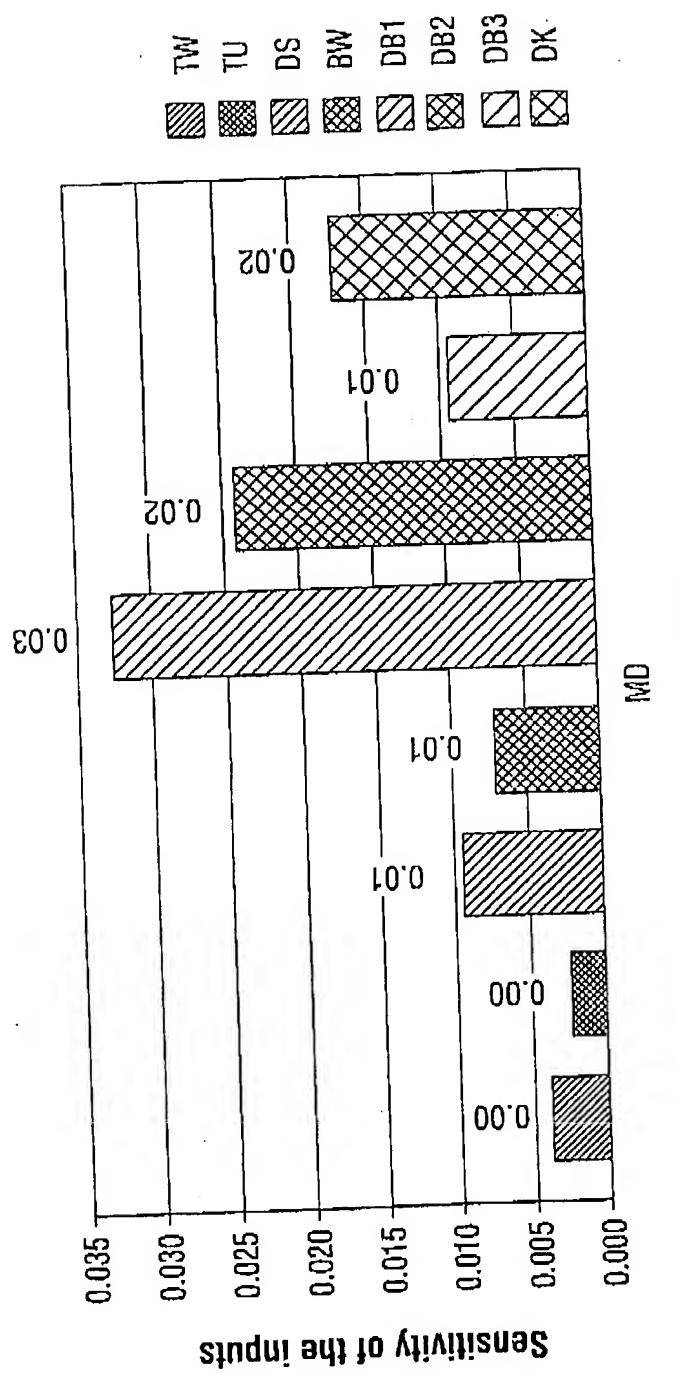


Fig. 8 : Sensitivity analysis of a hinge product
(sensitivity of inputs to output variables MD)

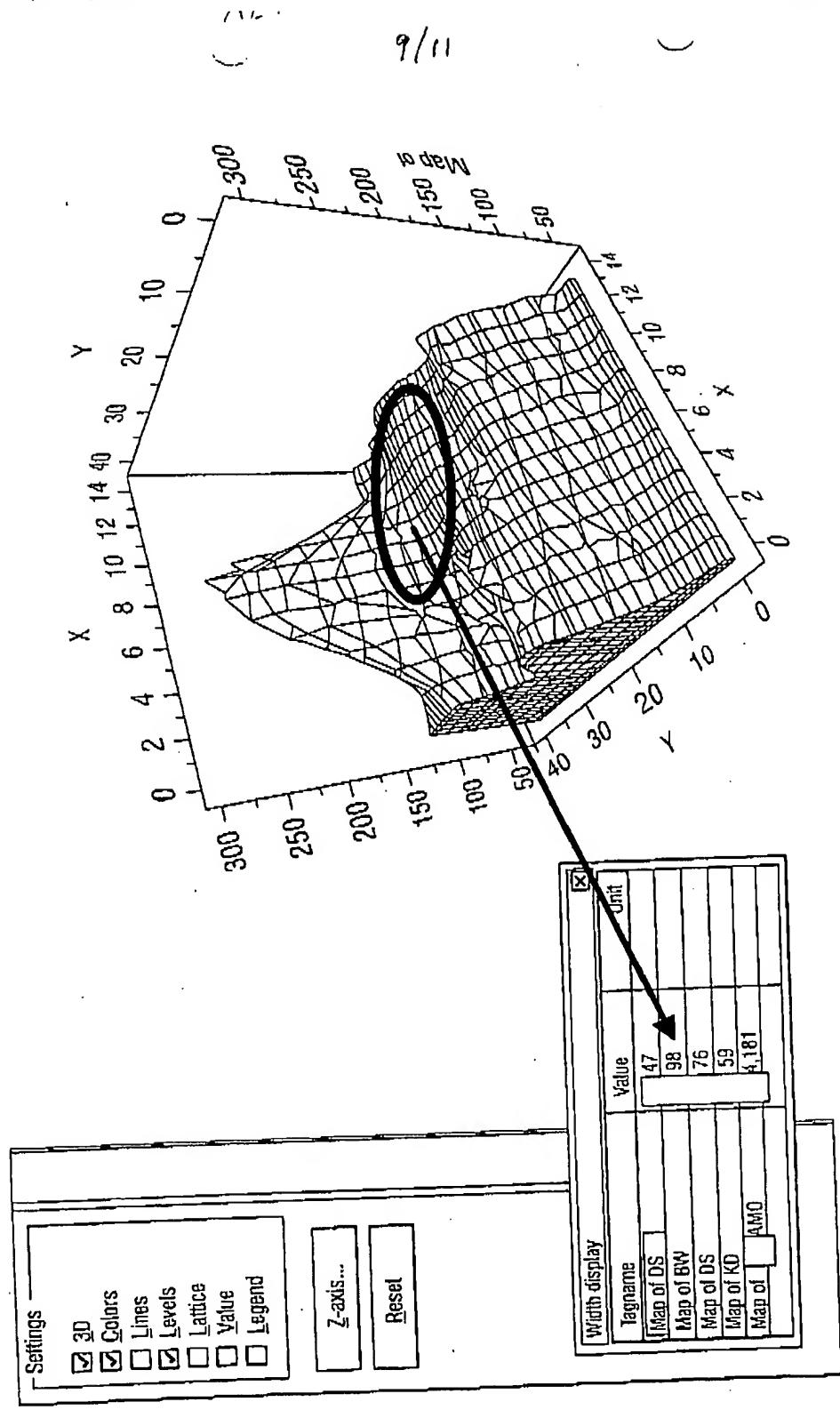


Fig. 9 : Process optimization via self - organizing maps by automatically back calculating the target variable MD to the input values to be set

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ID	TRA	Line	DK	DORN	SPS	TW	TU	DS	BW	DB1	DB2	DB3	MDmin	MDmax	MD
1234	AAB	R	0.019	90	23.81	25.23	0.01382	0.000485	0.013957	0.013926	0.013954	1.319	1.457	1.392	
1123	AAG	R	0.019	90	24.33	24.47	0.01401	0.000471	0.013962	0.013956	0.013955	1.38	1.435	1.392	
4321	KKR	R	0.019	80	22.39	23.55	0.01289	0.000484	0.013961	0.013958	0.013942	1.357	1.438	1.392	
2468	RTG	R	0.017	70	25.11	24.7	0.01405	0.000468	0.013989	0.013966	0.013943	0.046	1.445	1.392	
12	UKK	R	0.019	90	23.35	23.95	0.01313	0.000473	0.013967	0.013966	0.013947	1.37	1.419	1.392	
1357	AAT	R	0.02	90	24.36	24.21	0.01199	0.000471	0.013987	0.013967	0.013955	1.369	1.427	1.392	

Fig. 10 : Depiction of possible input variables for hinges with target torque $MD = 1.392 \text{ Nm}$

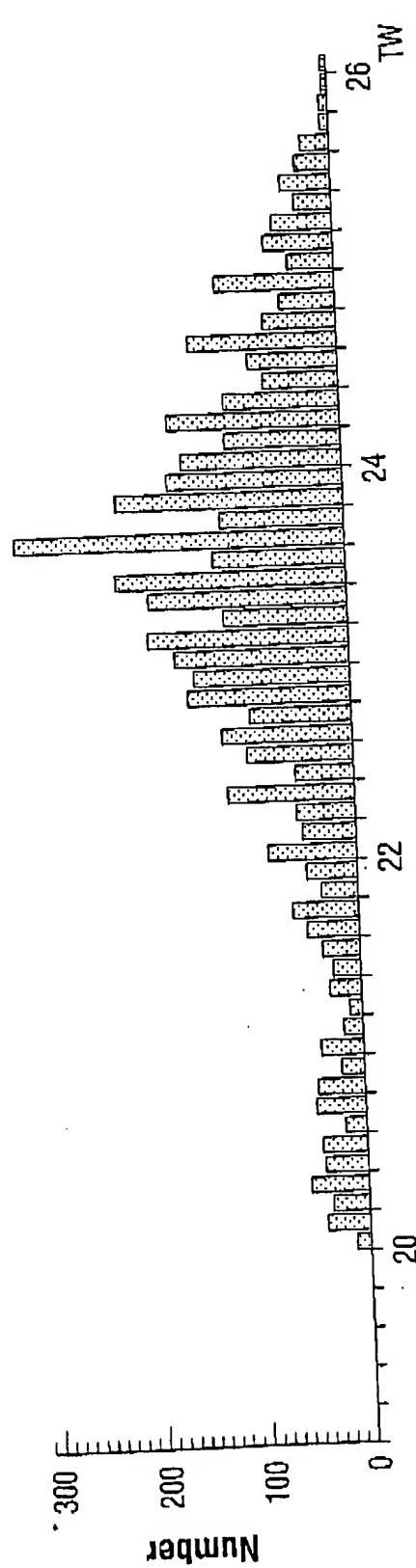


Fig. 11 : Histogram of temperature TW for a production line for manufacturing hinges